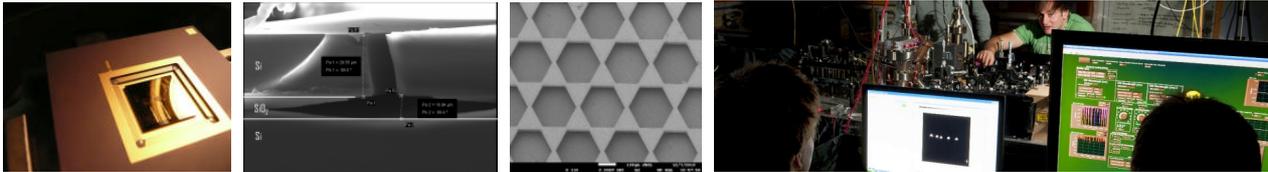


PhD position in trapped ion quantum technology and nanoscience at the University of Sussex, Brighton, UK

A three-year PhD position is available in the Ion Quantum Technology Group in the Department of Physics & Astronomy at the University of Sussex. The position is funded in conjunction with an EPSRC funded £1.4M Leadership fellowship for the development of quantum technology with nanofabricated ion trap chips.

Application deadline: 20 December 2012 (applications after this deadline may be considered if position is not filled)

Research in novel quantum technologies will likely lead to step changing innovations which will affect many areas of modern sciences. Implementing such technologies with trapped ions quantum bits has been widely accepted as one of the most promising pathways. The aim of this studentship is to produce advanced nano-fabricated ion chips and to carry out entanglement experiments with trapped ions in order to build a practical ion trap quantum computer.



One of the main aims of the project is to develop ion chips that feature on-chip digital signal processing and specialized architectures for large scale entanglement generation. Furthermore, you will also carry out studies to implement on-chip cavities, fibre interconnects to the ion trap array for advanced ion quantum state detection capabilities and other advanced features. You will create microchips for large scale entanglement creation of trapped ions on a chip. Once suitable ion chips are available you will carry out entanglement experiments and create practical quantum simulators.

You will learn all the experimental skills and theoretical background needed in this emerging field of science. Some of the skills you will acquire include nano-fabrication, lasers and optics, ultra-high vacuum techniques, quantum information science, electronics and many other skills. You will spend your first year primarily at Sussex where you will become an expert in ion trapping. Following that you will spend some periods of time at clean room facilities carrying out microfabrication in state-of-the-art clean rooms. Once the first chips have been created, you will carry out quantum information experiments with trapped ions. The position consists of current UK/EU fees and a yearly stipend of £ 13590 which can be supplemented by tutoring.

The city of Brighton & Hove has everything - sun, sea, brilliant clubs, great places to eat, fabulous shops, a truly cosmopolitan vibe and is located only 50min from central London. Located on the beach, Brighton boasts beautiful seaside views and beaches, boating, sports and beach activities. The South Downs provide breathtaking views, tranquil walks and plenty of opportunities for mountain biking, hiking or picnics.

You can find out more about the group here (including a BBC documentary about our research group):

<http://www.sussex.ac.uk/physics/iqt/>

The 'Research' section of the website features specific information for prospective PhD students. You can also take a virtual lab tour.

Detailed reading about some of our research directions can be found here:

- Microfabricated Ion Traps, Marcus D. Hughes, Bjoern Lekitsch, Jiddu A. Broersma and Winfried K. Hensinger, Contemporary Physics 52, 505 (2011)
- Microwave ion-trap quantum computing, Winfried K. Hensinger, Nature 476, 155 (2011)

For more information, please email the head of group,
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To apply please email a CV, and your degree results **preferentially before 20/12/12** to the email address above. Note in order to qualify for this position you must have resided in the UK or Europe for three years prior to the start of the position.

